

EFFECT OF CITRATE ENRICHMENT ON ISOCITRATE DEHYDROGENASE ENZYME OF THE CYANOBACTERIUM *NOSTOC MUSCORUM* MEG 1

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Abstract—Is citrate dehydrogenase (IDH) catalyzes the oxidative decarboxylation of is citrate to α -Ketoglutarate. It forms a connecting link between carbon and nitrogen metabolism in organisms. Its substrate is citrate is made from citrate and in the present study the effect of citrate enrichment on the activity and the protein content of IDH were analyzed. IDH activity and expression of IDH protein investigated using western blot analysis showed an increase in both these parameters when 100 μ M citrate was supplemented in the growth medium indicating that with the availability of the source of is citrate more enzyme was synthesized and additionally the activity was also augmented. Increased activity of this key Citric acid enzyme was also reflected in increase in the parameters of carbon and nitrogen metabolism such as photosynthetic pigments, activity of oxygen evolving complex, carbohydrate, biomass and protein production, heterocyst, nitrogenise and glutamine synthetase (GS) activities and protein contents of both nitrogenise and GS enzymes, all that are energy requiring processes. The same parameters studied at 250 μ M citrate supplementation, showed none or very minor increase in the above mentioned parameters compared to the control. SEM and TEM micrographs of the treated cultures reveal that morphologically and ultra-structurally the organism was not visibly affected in presence of 100 μ M citrate. Although not all, but many cells in the cultures treated with 250 μ M citrate showed changes in their morphology and ultra-structure. Presence of 500 μ M citrate recorded highly compromised C- and N-parameters specifying that at this concentration citrate becomes toxic to the organism.

Keywords: Cyan bacteria; citrate; is citrate dehydrogenase; C- and N- metabolism.